<< Zheriz's War Files >> Panzer Optics/Sight Guide

Overview

Zeiss sights are available in German tanks at the Gunner's position. Zeiss sights give the Panzer gunner an advantageous ability among WW2 tanks to determine the range to a target without the need to fire ranging shots. Used correctly, these sights give the Panzer gunner the following advantages:

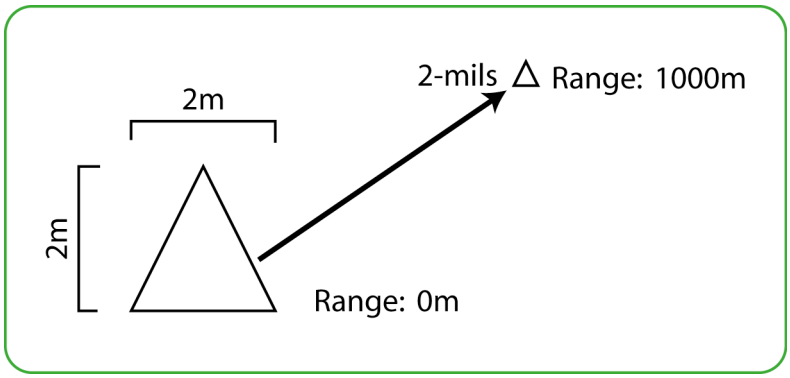
- The ability to reliably hit a target with the first round ("first shot, first kill").
- The ability to hold your fire — to know if the target is inside your guns penetration envelope versus that targets armor thickness. ("Am I close enough to kill it?")
- An ability to hit the target with fewer rounds, conserving ammo.
- A lower probability of detection, since the less you fire the less the chance you will be spotted by enemy units.

How it Works

Zeiss sights work on the idea that if you have two objects of known size and one of those objects is at a known range, then you can deduce the range of the other object by doing a size comparison of the two objects.

For example, you know that 2 boxes are each 2m wide. You know that Box–A is 1000m away and appears to be 1cm wide at that range. Box–B is at an unknown range, but appears to be 2cm wide. Since it appears twice as wide, you can deduce that it is closer and exactly 500m away. If it appeared to be 0.5cm wide, it would be twice as far, so at 2000m. And so on.

A Zeiss sight works the same way, but instead of boxes it uses triangles of 2m size as they would appear positioned 1000m away from you.



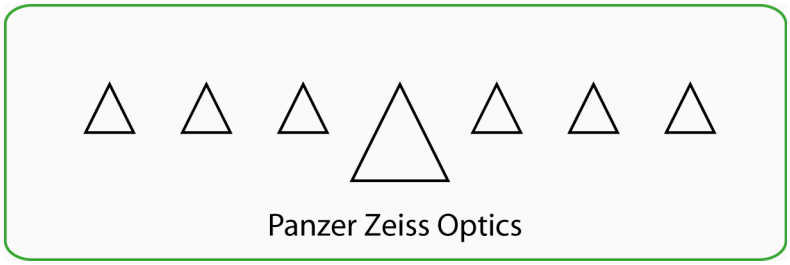
Apparently, this set-up was technically known as a "Mili–radian sight", which later became abbreviated to a "mils sight". "Mils" becomes a short–hand way for saying

"meters at 1000m range". Therefore, this 2m triangle at a range of 1000m is said to be 2-mils triangle. (See diagram).

This is the "trick" that makes the Zeiss sight such a powerful advantage for Panzer gunners. By comparing the triangles against the known size of the enemy tank, a range can be determined.

The Panzer Zeiss Sight

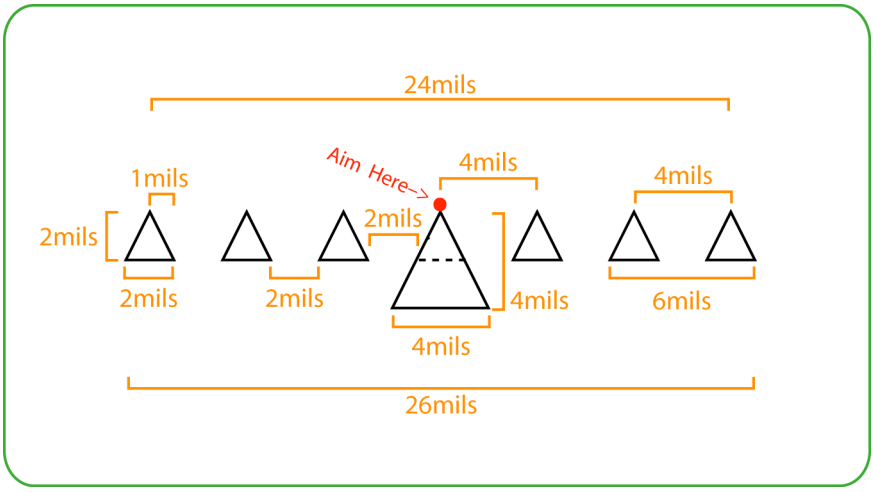
This system is extrapolated to a more advanced form as seen in the Panzer Zeiss sights. The Zeiss sight uses seven triangles: six small and one large. This is necessary so that the target object size can be measured and computed at all ranges – instead of only 1000m.



On the right is the deceptively simple Zeiss sight without the range arcs. I didn't include the range arcs ("circles") in this tutorial because they're after the fact. You dial the range arc based on the range the Zeiss sight gives you and not vice versa. The range arc settings in the Keymapper are PgUp and PgDown. The range arc sometimes has 2 arcs. The inner arc is always for AP rounds and the outer arc is for HE rounds.

What does the sight mean?

Okay, this diagram can be confusing so take your time and notice all the details. It is critical that you understand the dimensions of this sight because you will measure your target dimensions against it.



First, notice that the aim point is at the top tip of the 4-mil triangle and NOT at the center of the triangle as most players believe. That aim point is where the gun round is calibrated to hit.

Second, notice that the large 4-mils triangle has twice the dimensions of a 2-mils triangle – this fact comes handy later. The top of it is the same size as the other small triangles (I put in a dashed line so you can see it easily).

Third, notice that the space between ALL the triangles is 2-mils at the bottom and 4-mils at the top. It's 4-mils at the top because, as indicated, half of each triangle is 1-mils, so from tip to tip it's: 1-mils + 2-mils + 1-mils = 4-mils. You have to train yourself mentally to interpret the bottom and top gaps as 2-mils and 4-mils. The mind has a tendency to count only the triangles and to ignore the spaces. The large triangle also makes you think the spaces around it are larger but in truth the spaces around it are the same as those around the small triangles.

Ziess Sight Limitations

Overall, the Zeiss sight is excellent but has some limitations:

- For targets from 0—1200m the sight is excellent for ranging.
- From 1200—2000+m it is less effective since the target can become very small and hard to compare.
- Low contrast situations (fog, night–time lighting, camouflage and obstructed views from vegetation) can make seeing the edges of the target difficult, which can make a size comparison inaccurate.
- Brightly colored tanks will seem closer than they are, while darker colored tanks will appear farther away, so trust the Zeiss sight instead.
- Moving targets can make a comparison difficult.

Combat Use #1: Ranging an ET

To use the Zeiss sight in combat can be either hard or easy. The hard way is to measure the target size and compare it against the known size of the target and mentally (or by calculator) do the math to finally determine the range. This is a lousy way to do it and for some reason all of the scarce few Zeiss guides available use this method. Frankly, it's a slow and tedious way to do it. Do you really want to do math under fire? I didn't think so.

Or you can do it the way WW2 tankers did using Range Tables, which I have provided below. It works like this:

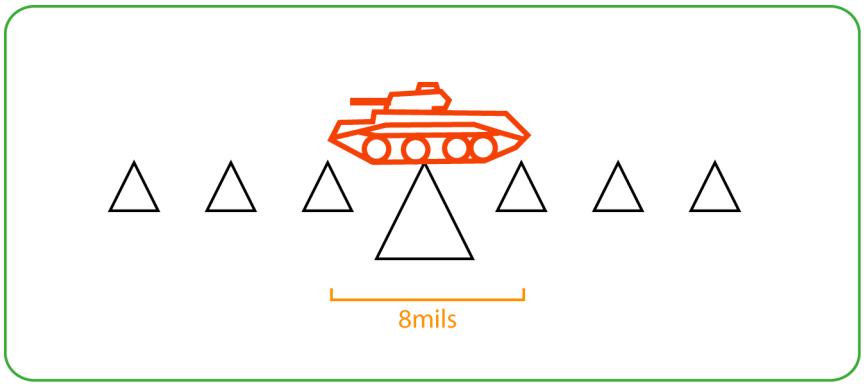
1) Measure the size of your target in Mils using the triangles
2) Get your range value from the handy printed Range Tables.
3) Dial your range, set the aim point on the hull or turret and fire! If you leave the aim point in the measuring position (see diagram) you're round will probably hit the dirt just short of the treads.

The only catch is that you have to compare the correct dimension. If you measure the length of the target, then you have to use the length column values. If you measure width, you have to use the width column values. It's pretty simple.

Width is the head–on view. Length is the side view. Usually, you will either get a length or width measurement since the target is either side–ways (length) or facing you head–on (width), respectively.

What is height for? The height measurement is used for diagonal measurements. If the target is facing you at a diagonal, you cannot measure either the width or length since the perspective is skewed. So you have two options: 1) you wait for the target to face you the right way or 2) you measure the height and get your range that way. Either way is fine, but sometimes waiting is not an option so just measure the height.

Example
Here an A-13 Cruiser is facing length–wise and it has a Mils size of 8. In the range tables for A-13 under "length", we get a range of 753m.



You can measure the target using the tops or bottoms of the triangles. You don't have to use the center of the sight either; you can measure from the ends too. Just as long as you can count the Mils size, it doesn't matter how it's done.

TIP: the 4-mil triangle has a handy use. If you think about it, it's the same 2m triangles; only it's set at 500m instead of 1000m. Since most tanks are about 2m tall, any tank that fits the 4-mil triangle top to bottom is roughly 500m away – a handy way to get a quick estimate.

Combat Use #2: Ranging terrain

This is a good Zeiss trick for pre–ranging terrain. With 1–shot you can get a range to any point. This is great for ambushes and static defense. Let's say you know that enemy tanks will be coming over that hill over there and you want to range the hill. This is what you do.

1) Place the aim point on the area you want to range and dial–in an estimated range. Fire one shot and observe the impact point.
2) Move the turret so that the Zeiss aim point overlays the impact point (don't touch the range dial)
3) Now without moving the turret, dial up the range arc until the aim point moves up (or down) to match the area you really wanted to hit in the first place. Bingo! You have ranged that area.

Final words

The best part is, if you know the size of anything, you can use the Zeiss sight. For example, the 'white' roads are 8m wide, while the 'red' roads are 4m wide. An AB wall is about 2.5m high. An infantry unit is 1.80m tall. Any of these values can be used to give you a range using the Zeiss sight. The general formula is:

(Known size x 1000) ÷ Mils size = range

The Zeiss sight can be a great advantage, but it requires practice. Trying to use the Zeiss sight while someone is firing at you can be nerve wracking, but with practice you can do it in a split second and kill the ET with one shot while he's still trying to range you with a hail of fire. So be patient and practice, it does pay–off. So go forth and strike fear into Allied tankers! =)

Final *final* Words: this guide is not as developed as I'd like. I wanted to add more visual examples and detail, but it will have to wait for a future update to this file. A car hit my puppy recently (it survived with surgery) and caring for it is time consuming… and so on.

Panhard range by...			
mils	length	width	height
1	4,620	2,260	2,360
2	2,310	1,130	1,180
3	1,540	753	787
4	1,155	565	590
5	924	452	472
6	770	377	393
7	660	323	337
8	578	283	295
9	513	251	262
10	462	226	236
12	385		
14	330		

R-35 range by...			
mils	length	width	height
1	3,990	1,880	2,100
2	1,995	940	1,050
3	1,330	627	700
4	998	470	525
5	798	376	420
6	665	313	350
7	570	269	300
8	499	235	263
9	443	209	233
10	399	188	210
12	333		
14	285		

H-39 range by...			
mils	length	width	height
1	4,220	1,950	2,150
2	2,110	975	1,075
3	1,407	650	717
4	1,055	488	538
5	844	390	430
6	703	325	358
7	603	279	307
8	528	244	269
9	469	217	239
10	422	195	215
12	352		
14	301		

S-35 range by...			
mils	length	width	height
1	5,300	2,100	2,620
2	2,650	1,050	1,310
3	1,767	700	873
4	1,325	525	655
5	1,060	420	524
6	883	350	437
7	757	300	374
8	663	263	328
9	589	233	291
10	530	210	262
12	442		
14	379		

Char range by...			
mils	length	width	height
1	6,300	2,480	2,740
2	3,150	1,240	1,370
3	2,100	827	913
4	1,575	620	685
5	1,260	496	548
6	1,050	413	457
7	900	354	391
8	788	310	343
9	700	276	304
10	630	248	274
12	525		
14	450		

M3 Stuart range by...			
mils	length	width	height
1	5,030	2,520	2,570
2	2,515	1,260	1,285
3	1,677	840	857
4	1,258	630	643
5	1,006	504	514
6	838	420	428
7	719	360	367
8	629	315	321
9	559	280	286
10	503	252	257
12	419		
14	359		

M4 Sherman range by...			
mils	length	width	height
1	5,030	2,520	2,570
2	2,515	1,260	1,285
3	1,677	840	857
4	1,258	630	643
5	1,006	504	514
6	838	420	428
7	719	360	367
8	629	315	321
9	559	280	286
10	503	252	257
12	419		
14	359		

Steps

1) Determine target Mils size either by length, width or height
2) Compare the Mils size to the length, width or height and you'll have your range.
3) Dial the range into your range arc, aim and fire!

Example:
A target Panhard facing sideways has a Mils size of 6-mils. So, 6–mils under the "length" column is a range of 770m.

Range is in meters.

Vickers range by...			
mils	length	width	height
1	3,950	2,060	2,220
2	1,975	1,030	1,110
3	1,317	687	740
4	988	515	555
5	790	412	444
6	658	343	370
7	564	294	317
8	494	258	278
9	439	229	247
10	395	206	222
12	329		
14	282		

Daimler range by...			
mils	length	width	height
1	4,000	2,460	2,260
2	2,000	1,230	1,130
3	1,333	820	753
4	1,000	615	565
5	800	492	452
6	667	410	377
7	571	351	323
8	500	308	283
9	444	273	251
10	400	246	226
12	333		
14	286		

A-13 range by...			
mils	length	width	height
1	6,020	2,540	2,590
2	3,010	1,270	1,295
3	2,007	847	863
4	1,505	635	648
5	1,204	508	518
6	1,003	423	432
7	860	363	370
8	753	318	324
9	669	282	288
10	602	254	259
12	502		
14	430		

Crusader-2 range by...			
mils	length	width	height
1	5,970	2,770	2,240
2	2,985	1,385	1,120
3	1,990	923	747
4	1,493	693	560
5	1,194	554	448
6	995	462	373
7	853	396	320
8	746	346	280
9	663	308	249
10	597	277	224
12	498		
14	426		

Crusader-3 range by...			
mils	length	width	height
1	6,310	2,770	2,240
2	3,155	1,385	1,120
3	2,103	923	747
4	1,578	693	560
5	1,262	554	448
6	1,052	462	373
7	901	396	320
8	789	346	280
9	701	308	249
10	631	277	224
12	526		
14	451		

Matilda range by...			
mils	length	width	height
1	5,610	2,590	2,510
2	2,805	1,295	1,255
3	1,870	863	837
4	1,403	648	628
5	1,122	518	502
6	935	432	418
7	801	370	359
8	701	324	314
9	623	288	279
10	561	259	251
12	468		
14	401		

Steps

1) Determine target Mils size either by length, width or height
2) Compare the Mils size to the length, width or height and you'll have your range.
3) Dial the range into your range arc, aim and fire!

Example:
A target Panhard facing sideways has a Mils size of 6-mils. So, 6–mils under the "length" column is a range of 770m.

Range is in meters.